manual
temperature monitor
YT353100

table of contents

safety instructions

Read the product description before installing the unit. Ensure that the product is siutable for your application without any restrictions.

Non-adherence to the operating instructions or technical data can lead to personal injury and/or damage to property.

In all applications check compliance of the product materials.

Never use these devices in applications where the safety of a person depends on their functionality.

controls and indicating elements
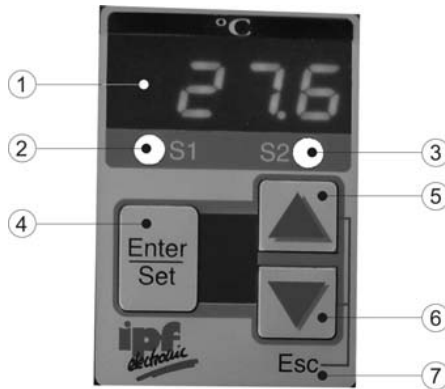
	description	function	symbol
1	4-digit display	displays the current system temperature parameter, parameter values	265.4
2	LED red S1	displays the switching state of output 1 *lights, if the output is switched*	-
3	LED red S2	displays the switching state of output 2 *lights, if the output is switched*	-
4	programming button Enter/ Set	selection of menu and parameters setting and saving of parameters	Enter Set
5	arrow key up	setting the parameter values increasing the value *(fast, keep the button pressed)*	▲
6	arrow key down	setting the parameter values decreasing the value *(fast, keep the button pressed)*	▼
7	ESC	finishing programming without saving keyboard lock: press both the arrow keys at the same time	▲▼ESC

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description of the operational controls

display
4-digit LED display

symbolic description:

265.4   shows the current system temperature (RUN-Mode), menu name, parameters and parameter values.

265.4   blinking display in RUN-Mode: fault report (Error)
3 x blinking in PROGRAMM mode: saving current value after pressing Enter/Set button

SP2   The indication on the display depends on the programmed functions. If one of these functions is selected in the enhanced Menu, the indication will be shown on the display.

program button Enter/Set

symbol:

Enter
Set

Selection of menus and submenus as well as confirming and saving of parameter values.
Short pressing in the RUN-Mode → starting up the main menu.

arrow keys
symbol:

▼ and ▲

Increasing and decreasing the parameter values and scrolling of the menu.
Pressing the button continuous, the value increases or decreases in „fast-forward" mode.
Pushing the button → the value changes step by step.

ESC- button

symbol:

ESC

Pressing both arrow keys ▼ + ▲ **at the same time** results in the **ESC** function.

With the ESC function you can step backwards inside the menu and parameters <u>without</u> saving the settings.

In order to leave all menus and submenus please press the **ESC**-button again and again until you are back in the RUN-mode.
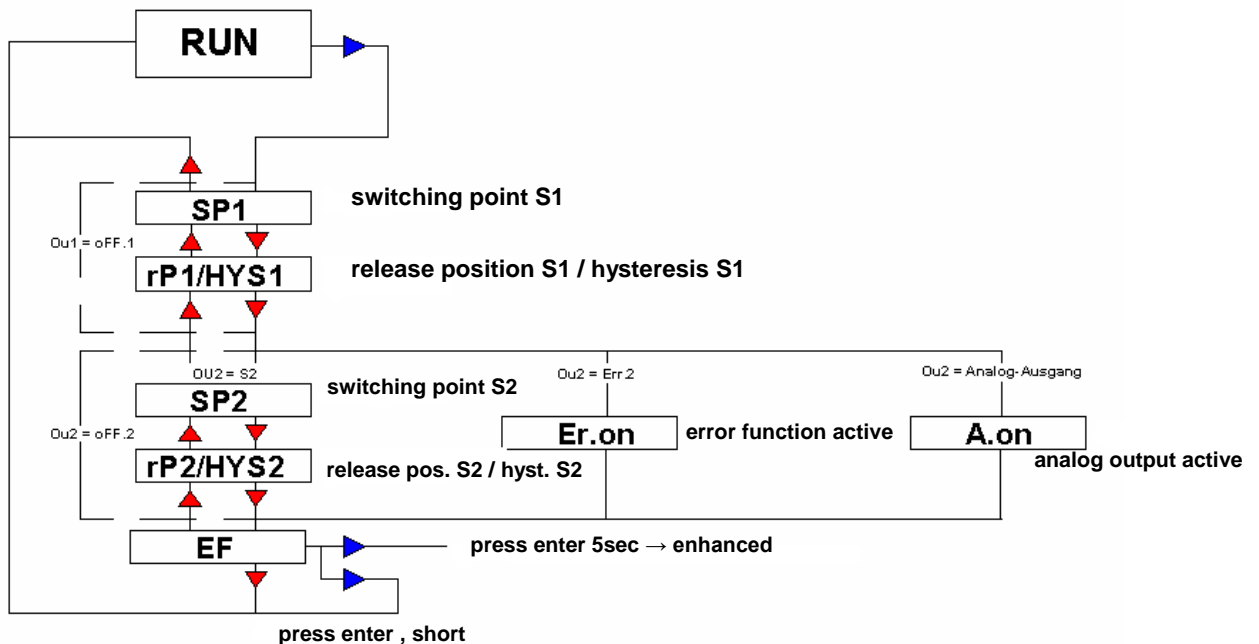
keyboard lock

If the device is in the RUN-Mode and you press the arrow keys ▼ + ▲ at the same time for at least 5 seconds, the keyboard lock will be activated.

The display shows „sLOC", blinking 3 times.

Now the adjusted settings can be read but not be changed.

For cancelling the Keyboard Lock please press both arrow keys ▼ + ▲ for at least 5 seconds again.

menu / overview

RUN

SP1 — switching point S1

Ou1 = oFF.1

rP1/HYS1 — release position S1 / hysteresis S1

OU2 = S2

SP2 — switching point S2

Ou2 = oFF.2

Ou2 = Err.2

Er.on — error function active

Ou2 = Analog-Ausgang

A.on — analog output active

rP2/HYS2 — release pos. S2 / hyst. S2

EF — press enter 5sec → enhanced

press enter , short

2. level

rES	►	press Enter for 5sec to make a factory reset
Ou1	►	output 1 configuration
		SP.rP — switching point / release position
		SP.HY — switching point / hysteresis
		FE.rP — window function / release position
		FE.HY — window function / with hysteresis
		oFF.1 — output 1 off
noc1	(Ou1 = oFF.1) →	no.1 / nc.1 — switching mode S1
dS1	►	0.30 — turn-on delay S1
dr1	►	0.00 — turn-off delay S1
Ou2	►	output 2 configuration
		SP.rP
		SP.HY
		FE.rP — output 2 = S2
		FE.HY
		Err.2 — output 2 = error signal
		4-20
		0-20
		20-4
		20-0
		0u10 — output 2 = analog
		0u5
		10u0
		5u0
		oFF.2 — output 2 off

see analog menu

noc2	(Ou2 = oFF.2/Err.2 Ou2 = S2) ►	no.2 / nc.2 — switching mode S2
dS2	►	0.30 — turn-on delay S2
dr2	►	0.00 — turn-off delay S2
Hi	►	157 — max. peakvalue ▼ = delete
Lo	►	16 — min. peakvalue ▲ = delete
CYC	►	120 — counter switching cycles of S1
COF	►	0.0 — offset setting (±10%)
ddIS	►	0.0 — display damping (peak-hold-time)
FdIS	►	function display
		rd — rotate display
		Ph — peak-hold
		rd.Ph — rotate and peak hold
		oFF — standard display
tESt	►	press Enter for 5sec → test function (no timeout)
End	►	end of enhanced functions

menu analog (active only if in OU 2 an analog signal is set)

Ou2= analog output

ASP	analog start value
AEP	analog stop value
dAA → 2.50	damping of the analog output
FOuA → <3.6 / >22	error–signal for analog output (in 4 ... 20mA / 20 ... 4mA only)
EdA → Ed.on / Ed.oF	error–display for analog output (in 4 ... 20mA / 20 ... 4mA only)

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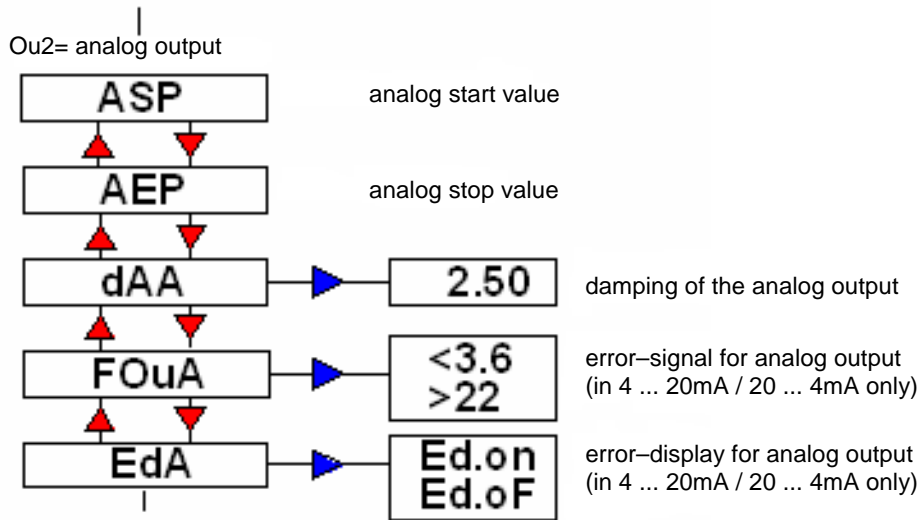
operation modes of the switching outputs

notes:

- The following examples and descriptions of the switching output 1 (SP-1) refer to the switching function „normally open" (no). If the switching output 1 is set „normally closed" (nc) the states are reversed.

- The minimum range between the switching outputs (SP.1 and rSP.1) is 1% of the temperature range; stated by the system.

- The smallest adjustable hysteresis is 1% of the temperature range; stated by the system.

- All examples are effective for output 2, if this output is defined as switching output (SP-2) also.

switching point with release position
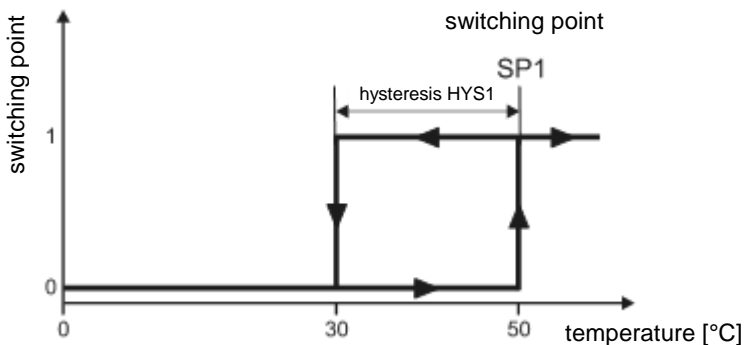
programmed parameters: SP.1:   100.0°C
                                 rP.1:   40.0°C
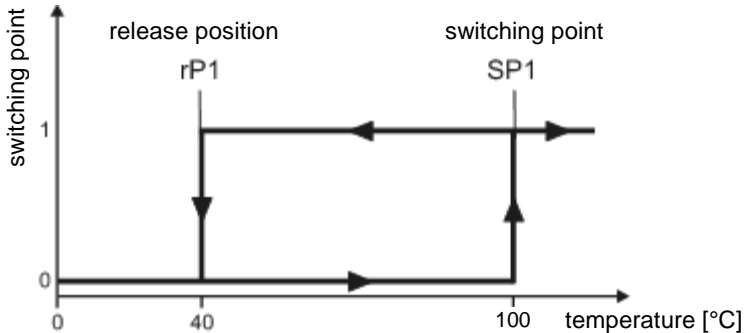
An increasing temperature up to SP.1 (e.g. 100°C), switches the output according to the adjusted switching function (no or nc). This state remains also for higher temperatures.
For decreasing temperatures the switching state changes with the temperature value at rP.1 (e.g. 40°C). If SP.1 will be changed, rP.1 remains the same.
The minimum range between SP1 and rSP.1 is 1% of the maximum temperature.

switching point with hysteresis

programmed parameters: SP.1:   50.0°C
                                 HYS.1:   30.0°C

An increasing temperature up to SP.1 (e.g. 50°C) switches the output according to the adjusted switching function (no or nc). This state remains also for higher temperatures.
For decreasing temperatures the switching state changes after passing the hysteresis (e.g. 30°C). If SP.1 will be changed, the hysteresis HYS1 remains the same, that means the release position is (SP.1 – 20°C).

window function with release position

programmed parameters: SP.1:   50.0°C
     rP.1:   40.0°C
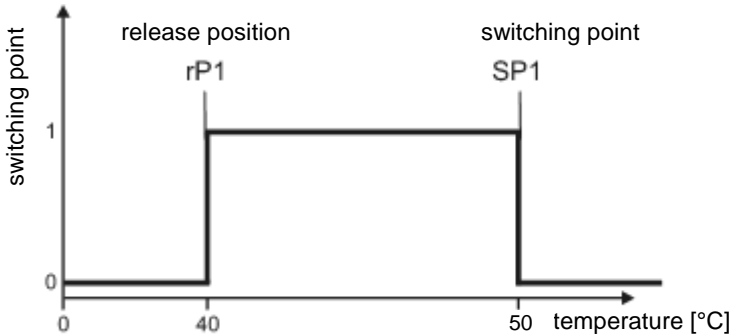
Due to the window function, the monitoring of a defined temperature range is possible. As soon as the temperature reaches the adjusted range between rP.1 (40°C) and SP.1 (50°C), the output switches according to the chosen switching function (no or nc). The switching state changes if the temperature leaves the adjusted temperature range. The values for the switching point and the release position have to be defined separately. If SP.1 changes, rP.1 will remain the same.

windowfunction with hysteresis

programmed parameters: SP.1:   50.0°C
     HYS.1:   30.0°C
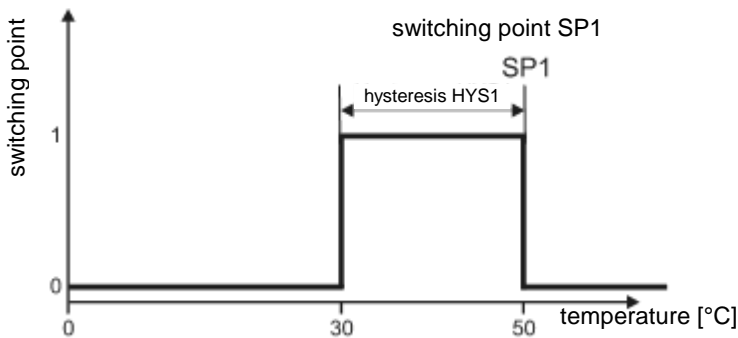
If the temperature hits the adjusted window between (SP.1-HYS.1) and SP.1 (50°C), the output switches according to the adjusted switching function (no or nc). The switching function changes when leaving the window. If SP.1 changes, the hysteresis will not change, e.g. the release position is (SP.1 – 20°C).

operating modes

RUN-Mode
Normal operating mode
At power on the unit is in the RUN-mode. It carries out its measurement and evaluation functions and provides output signals according to the set parameters.
The display shows the current system temperature. The red LEDs indicate the switching state of the outputs.

display mode
Display and adjustment of the switch-points, release positions and of the hysteresis. When the *Enter/Set* button is pressed briefly, the main menu opens. The internal sensing, processing and output functions of the unit continue as if in RUN-mode. The parameter values can be read and adjusted.
Pressing the arrow key „downwards" briefly, scrolls through the adjustable parameters.
Pressing the *Enter/Set* button briefly, shows the adjusted parameter value.
Pressing the arrow key „downwards" or „upwards" briefly, changes the parameter value step by step. Pressing the arrow key continuous changes the value fast.
Pressing the *Enter/Set* button safes the adjusted value, the display blinks three times.
The unit now operates with the „new adjusted" value.

Returning to the RUN-Mode: Press the *ESC* button.

Enhanced menu / programmimg mode
Setting of the parameter values and programming the main functions.
The unit changes to the programming mode if „EF" is set in the main menu and the *Enter/*Set button is pressed for at least 5sec*.
The internal sensing, processing and output functions of the unit continue as if in RUN-mode.

Pressing the arrow key „downwards"briefly, scrolls through the adjustable parameters.
Pressing the *Enter/Set* button briefly, indicates the adjusted parameter value
Pressing the arrow key „downwards" or „upwards" briefly, changes the parameter value step by step. Pressing the arrow key continuous changes the value fast.
Pressing the *Enter/Set* button safes the adjusted value, the Display blinks three times.
The unit now operates with the „new adjusted" value.

Returning to the RUN-Mode: Press the *ESC* button several times.

programming

button	display	description
Enter Set 1X	SP1	Press the Enter/Set button briefly to get into the main menu. Press the Enter/Set button again. The current value for switching point S1 will be displayed.* Set the parameter value with the arrow keys. Confirm the setted value with the Enter/Set button.
▼ 1X	rP1 / HYS1	Press the Enter/Set button. The current value for the release point S1 respectively the hysteresis will be displayed.* Set the requested value with the arrow keys. Confirm the value with the Enter/Set button.
▼ 1X		Output 2 is set as analog output: A.On Output 2 is set as switching output SP2 / rP2 respectively HYS2. Changes can be made as described above. Output 2 gives an error signal: Er.On As soon as the Outputs become inactive, EF will be displayed.
▼ 1X	EF	Press Enter/Set or ▼ briefly to get into the RUN Mode. Press the Enter/Set button continuously for min. 5sec to get into the enhanced functions. A point is blinking in the display as long as the button is pressed. Changes inside the menu items can be made as described above. The possible menu items can be seen in the parameter list.

*a flashing point on the display indicates that a value can be changed.
After confirming the set value the displayed value will blink three times.

parameter list

SP1	switching point S1
HYS1 / rP1	hysteresis S1 / release position S1
SP2	switching point S2
HYS2 / rP2	hysteresis S2 / release position S2
EF	This menu item encloses a sub menu which contains further parameters. Press the Enter/Set for at least 5sec to get access to these parameters.
rES	Reset (getting back to the factory settings) Press the Enter/Set button at least for 5sec to reset the system. Thereafter the unit returns into the RUN Mode automatically.

PtCo	configuration for PT100 sensors: 2-4.L connection of 2- or 4-wire sensors 3.L connection of 3-wire sensors This configuration is only programmable directly at the YT35.
0u 1	Configuration of output1: Four switching functions are possible: SP.HY switch-point / hysteresis SP.rP switch-point / release position FE.HY window function / hysteresis FE. rP window function / release position oFF.1 output 1 „off"
noc 1	*noc 1 is active if in Ou 1 a switching function is set.* Switching function of switching output S1: no.1 (normally open) nc.1 (normally closed)
ds 1	*ds 1 is active if in Ou 1 a switching function is set.* on-delay timer function S1
dr 1	*dr 1 is active if in Ou 1 a switching function is set.* off-delay timer function S1
Ou 2	Configuration Output 2: 4 switching functions, the error signal or 4 analog functions: SP.HY switch-point / hysteresis SP.rP switch-point / release position FE.HY window function / hysteresis FE. rP window function / release position Err. 2 error signal 4-20 analog signal 4-20mA 0-20 analog signal 0-20mA 20-4 analog signal 20-4mA 20-0 analog signal 20-4mA 0u10 analog signal 0-10V 0u5 analog signal 0-5V 10u0 analog signal 10-0V 5u0 analog signal 5-0V oFF.2 output 2 „off"
ASP	*ASP is active if in Ou 2 an analog signal was set.* Analog starting point: The temperature value (low temperature) where the analog output starts.
AEP	*AEP is active if in Ou 2 an analog signal was set.* Analog end point: The temperature value (higher temperature), where the analog signal ends. **Note:** The minimum range between starting point and end point is 20% of the measuring range for the DW35 type; and 50% of the measuring range for the DW36 type.

dAA	*dAA is active if in Ou 2 an analog signal was set.* Damping the analog output. This function filters peak values of short duration or high frequency. dAA-value = response time. Period of time between the changing of the temperature and the analog signal. (unit, seconds).
FOUA	*FOUA is active if in OU 2 an analog signal was set.* Error signal of the analog output. The analog output signal is <3.6mA or >22mA (for 4 ... 20mA/ 20 ... 4mA only)
EdA	Error display of the analog output. (for 4-20mA/ 20-4mA only) Ed.of display not active Ed.on display active
noc 2	*noc 2 is active if in Ou 2 a switching function is set.* Switching function of switching output S2: no.2 (normally open) nc.2 (normally closed)
dS 2	*ds 2 is active if in Ou 2 a switching function is set.* on-delay timer function S2
dr 2	*ds 2 is active if in Ou 2 a switching function is set.* off-delay timer function S2
HI	saving the max. temperature value of the system. The highest value is dislayed. ▼ = delete memory
LO	Saving the min. temperature value of the system. The lowest value is displayed. ▲ = delete memory.
CYC	counter switching cycles of S1
COF	zero-point calibration The internal measurand (working value of the sensor) is offset compared to the real measurand. Adjustment range: ±10% of the measuring range
ddIS	Damping of the display (Peak-Hold-Time)
FdIS	Display functions: rd rotate display Ph peak-hold. Temporary display of peak values Rd. Ph rotate display + peak hold oFF standard display

tESt	Press Enter/Set button for 5sec → test-function (no Timeout) With the Test-function you can check the adjusted parameters without influence for the system. The display starts with indicating the current temperature. Due to the arrow keys the displayed value can be increased or decreased. All parameters react as if the real temperature would increase or decrease. Leave the Test Mode with ESC. The display range of the test mode is -40 … +300°C
END	End of enhanced functions. Press the Enter/Set button twice to get into the RUN-mode again.

The units come with an optical interface that allows all parameters to be set and adjusted by a PC or notebook.

The suitable interface cable and Windows-Software can be ordered with the article number **AD000011**.

With the Software you are able to adjust all functions described above.

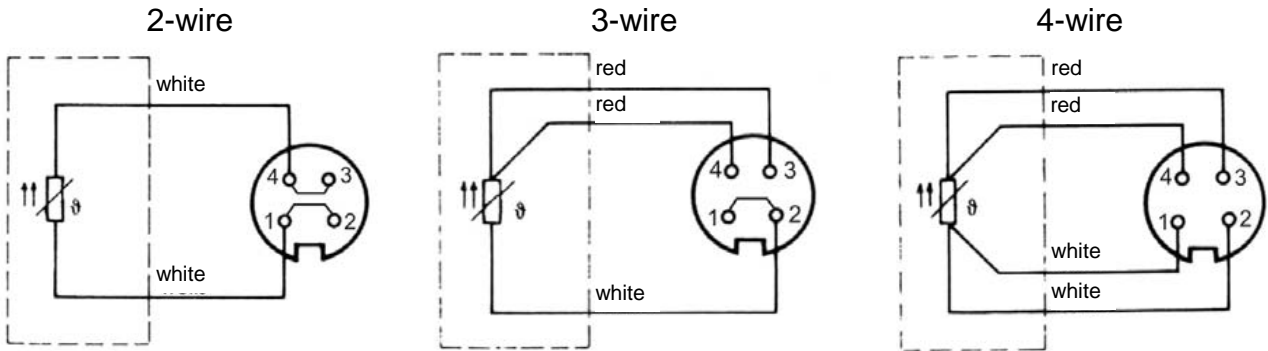| **mounting and electrical connection** |
|---|
| For wall mounting you can order a mounting clip with the article-no. **AY000060**.
 After mounting the sensor mechanically, the control panel can be rotated by 350° to align it for the machine operator. |
| The unit must be connected by a suitably qualified electrician. The national and international regulations for the installation of electrical equipment must be observed.
 Voltage supply to EN50178.
 The device shall be supplied from an isolating source and protected by an overcurrent device. Disconnect power before connecting the unit as follows: |
|
 bn (1) $+ U_B$
 wh (2)   Analog / Sp2 <br> bk (4)   Sp1 <br> bl (3)   0V
 PNP

 bn= brown, wh=white, bk=black, bl=blue <br> terminal marking of the cable socket in clamps |

NOTE: Use a shielded cable socket (e.g. **VK205321**), in order to avoid interferences.

connection of the PT100 sensors

The connection of a resistance thermometer takes place via a M12-socket on the device side. 4-wire system PT100 sensors with integrated M12-connector can be connected directly or with a connection cable (e.g. **VK030F25**) with the temperature monitor.
For PT100 sensors with a fixed cable use a M12-connector (e.g. **VK003028**). Depending on the version the connection pins must be bridged, as you see below:

2-wire	3-wire	4-wire

implementing / operation

After mounting, electrical connection and programming, please check the safety of the unit.

Fault indications during operation

| display	cause	effect on the outputs	elemination
OL	overload exceeding the measuring range > 368°C		-limit the system temperature
UL	underload measuring range undercut		
SC1	short-circuit S1	analog output= error signal*	- check wiring - check load of S1
SC2	short-circuit S2	analog output= error signal*	- check wiring - check load of S2.
SC	short-circuit S1 and S2	analog output= error signal	- check wiring - check load
ERR	sensor defect, internal error	-S1 and S2 are switched off - analog output = error signal*	contact manufacturer
AO	If current output is selected: analog output open If voltage output is selected: short-circuit or voltage applied		- check wiring - check burden resistance. **NOTE:** If this indication is undesired, the menu item **EdA** can be set **Ed.of**.

* the error signal of the analog output appears only, if in Ou2 an analog signal (4 ... 20mA or 20 ... 4mA) was set.
The error signal (< 3.6mA or >22mA) can be set in menu item FOuA.

factory settings	
OU 1	SP.rP
OU 2	4 - 20
SP 1	130°C
rP 1	-17.3°C
SP 2	215°C
rP 2	-17.3°C

technical data

temperature range [°C]	see list of articles
temperature detection	resistance thermometer PT100 (2-, 3-, or 4-wire)
operating voltage	12 to 32V DC, reverse polarity protection
voltage drop	< 2V
current consumption	< 60mA
switching outputs	2 x pnp-switching, no/nc 1A short-circuit protection
time delay	0 to 20sec, adjustable
switch-point adjustment range	1 to 100% of the accumulated value
release position	0 to 99% of the accumulated value
switching frequency	max. 125Hz
repeatability	< ±0,1% of accumulated value
current output	0/4 to 20mA, 20 ... 0/4mA, adjustable start and end point
burden	max. RL [W]=(Ub-8V) / 20mA
error recognition	analog output in case of line break (current) or short-circuit (voltage, from 1V)
rise time	5msec (10% ... 90% of PN)
damping	0 to 20sec, adjustable
linearity deviation	max. ±0.25% of PN
system temperature display	4 x 7 segment LED-Display
switching function display	2x LED red
operating temperature	-20°C to +80°C
connection of the PT100	M12-cable socket, 4-pin, with rotatable coupler
housing material	PA6.6, polyester
system of protection	IP65 to EN 60529
electrical connection	M12 connector 4-pin
optical interface	9600 Baud, via optical adapter at USB-Port

dimensional drawings
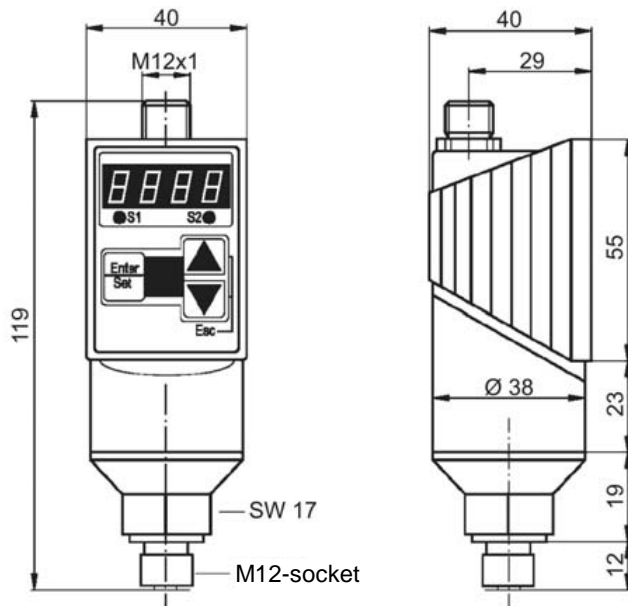
list of articles

article-no.	design	note	housing	voltage	output	current	connection
YT353100	35	-40 to +300°C	polyester / n-pltd. brass	12 … 32V DC	pnp, no/nc, 0/4 … 20mA	2x1A	M12-con., 4-pin
AD000011		accessory		optical interface	connection USB, software		1.5m cable
AD000060		accessory		mounting clip			

Revised version 10.02.2016 (analog output 0-10V)

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Subject to alteration!